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THE UNIVERSITY OF CHICAGO
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RESEARCH REPORT

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Bureau of Animal Industry
Animal Husbandry Division

BATTERIES FOR CHICKENS

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U. S. Department of Agriculture

The raising of chickens in batteries is a comparatively new method of brooding chicks which has already developed extensively throughout this country. Batteries are coops with wire floors, arranged in tiers, in which a large number of chickens can be kept together in a very sanitary condition. This method is now used for brooding "started" chicks, for raising broilers to market age, for brooding pullets for egg production, and to a very limited extent, for brooding turkey poults. Batteries are also used for laying hens.

The discovery that chickens could be raised indoors if they were fed a good ration, supplemented with cod-liver oil was soon followed by the use of battery brooders. Many types and sizes of batteries are in use, from the small batteries holding 200 to 300 chicks to the large units holding several thousand birds. Some batteries are heated individually while others are operated in heated rooms. All batteries have wire floors, and this is an important feature in the prevention and control of certain poultry diseases.

The use of battery brooders is advised for the raising of broilers and for raising all chicks where the soil is infected with disease germs. They are also used for brooding chicks on many farms where no trouble is experienced with disease organisms in the soil. Chickens that are to be kept for more than 10 to 12 weeks will do much better and require less care if raised on clean range after the brooding period. Batteries are also used for brooding chicks until they are about 3 weeks old, at which age the chickens are transferred to colony brooder houses on range. In producing broilers many poultrymen start the chicks in batteries, transfer them to brooder house pens when they are 3 to 6 weeks old, and then put them in fattening batteries for 10 days to 3 weeks before they are marketed as broilers.

Some of the advantages in the use of battery brooders are: Less disease in the brooding of chicks; faster growth, saving of brooder space; reduced labor costs, and operation independent of the season of the year and weather conditions. There is also considerable saving in cost of fuel. The chicks are kept in comparatively small groups so that there is less chance of crowding which often occurs in large flocks of chicks.

Battery brooding should be attempted only by those who will give regular and careful attention to the care of the brooders. As the chicks are closely confined, do not get any sunlight, and only get feed which is given them, they are absolutely dependent upon the operator of the brooder. Difficulties, such as the picking of feathers or flesh, and leg weakness of various kinds, are likely to occur in battery brooding.

Feeding the Chicks

Feeding is an extremely important factor in battery brooding as the chicks have no chance to balance their ration with green feed, minerals, and other feeds usually picked up on range. The chicks are fed all-mash rations which include milk and minerals. Fresh green feed is not usually supplied but alfalfa leaf meal is generally included as a substitute for green feed. Cod-liver oil must be included in the ration--one or two percent being sufficient. The use of this oil prevents leg weakness caused by a lack of vitamin D and sunlight.

The following all-mash rations are suggested for feeding broilers in battery brooders:

Mash No. 1		Mash No. 2	
	Parts, by weight		Parts, by weight
Yellow corn meal - - - - -	35	Yellow corn meal - - - - -	40
Middlings- - - - -	15	Middlings- - - - -	20
Bran - - - - -	11	Bran - - - - -	17
Heavy ground oats- - - - -	10	Meat meal- - - - -	7
Meat meal- - - - -	10	Fish meal- - - - -	4
Fish meal- - - - -	5	Dried milk - - - - -	4
Dried Milk - - - - -	5	Alfalfa leaf meal- - - - -	5
Alfalfa leaf meal- - - - -	5	Fine oyster shell- - - - -	2
Ground limestone - - - - -	3	Salt - - - - -	1
Salt - - - - -	1		
	<hr/> 100		<hr/> 100

Mash No. 1 is more forcing than mash No. 2 and contains about 19.5 percent protein, or 1 1/2 percent more than the other mash. Rolled oats are a good growing and fattening feed and could be substituted for the ground oats in the first mash or in place of 5 parts each of the bran and of the middlings in the other mash. Both rations should be supplemented with cod-liver oil mixed fresh in the feed. Chickens like a rather coarsely ground mash and this usually gives better results than finely ground feeds. Rice bran has been found helpful in preventing leg deformities not due to lack of cod-liver in the ration.

The chicks are usually given milk or water to drink and fed as soon as they are put into the brooder. Mash is kept before them all of the time. The light should be dimmed or shut off entirely to permit the chicks to have a rest period of from 11 to 12 hours each night. Chicks for broilers may be raised without any change in this feed except to omit the cod-liver oil for one week before marketing.

Chicks picking each other often cause great loss in battery brooding and it is difficult to control. The use of ruby-colored light in the room, either from colored bulbs or from stained windows, darkening the brooder room, or "tipping" the upper beak of the chickens, are some of the methods used in overcoming this vice. Not crowding the chickens will help to prevent picking. A soft, well-diffused light is desirable--one that does not make a bright light on the chicks.

Temperature and Humidity

The temperature to use depends on the kind of batteries and on the chickens. The object should be to keep the chickens comfortable at all times. This usually requires a temperature at the start of 90 to 95 degrees, which is gradually reduced from $1\frac{1}{2}$ to 1 degree daily to a temperature between 70 and 78 degrees by the end of the fourth week. A fairly rapid reduction of temperature tends to improve feather growth.

Good ventilation is very essential where large numbers of chicks are kept in battery brooders. The brooders should be operated in well insulated rooms with ceilings from 8 to 10 feet high. Fairly high humidity in the room is desirable, especially for chicks from 1 to 3 weeks old. A relative humidity of about 75 degrees is suggested for the first week which may be gradually reduced to about 50 degrees at 3 to 4 weeks. Since chicks of various ages are usually kept in one room a fairly high humidity should be maintained. The humidity may be obtained by sprinkling the floor with water several times a day.

Because chicks grow rapidly there is a tendency to permit the batteries to become crowded. About 100 chicks are started in a tray 3 feet square, and this number should be reduced to about 50 at 3 weeks and again reduced to 25 at 6 weeks. Very strict sanitation is essential in this method of raising chicks. The dropping pans should be cleaned daily and the batteries kept disinfected.

Battery brooders are used most extensively for producing broilers for market during the winter months. Leghorn cockerels will weight from 1 1/2 to 1 3/4 pounds at about 9 weeks of age; the large breeds are usually marketed when they weight from 2 to 2 1/2 pounds, which will be at from 9 to 12 weeks of age. It takes from 6 to 7 pounds of feed to grow a 2-pound broiler in the heavier breeds, and 9 to 10 pounds to grow a 3-pound chicken. Broilers raised in batteries are usually more tender and in better flesh than broilers raised on range. The highest broiler prices are usually obtained in February, March, and April, and the lowest prices in September, October, and November. The higher prices of early spring gradually taper off but usually remain fairly good through June and into July. Broiler prices fluctuate much more both with seasons and with different years than prices of other classes of poultry. This makes it very difficult to estimate at hatching time the prices the chicks will bring 10 to 12 weeks later as broilers.

Batteries for Laying Hens.

Batteries are being used to some extent for laying hens in which only one hen is kept in each compartment. While it is possible to keep more hens in laying batteries than in ordinary laying houses on the same amount of floor space, the battery method requires much more equipment. Laying batteries offer many advantages to poultry breeders who desire to keep individual records of their pullets. This year one of the egg laying contest has started keeping the hens in batteries.

With good equipment and comfortable houses hens in batteries have laid as many eggs and have kept as healthy as hens in pens. The use of artificial heat in the battery building during the winter is a great aid in keeping the birds comfortable in most sections of the country. Hens in batteries need to be kept in well ventilated rooms where plenty of fresh air is supplied.

Reports on the use of these laying batteries have been quite favorable; but this is a new idea, and the use of these batteries for laying hens, as well as a knowledge of the best type of battery to use, is still in the experimental stage.